

REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested. Claim 1 has been amended to clarify the language and the amendment is fully supported by the original specification. Attached is a marked-up version of the changes being made by the current amendment.

In addition, drawings have been amended to correct the informalities and the clerical errors as indicated in the office action. FIG. 1 has been amended to show that the bottom contact layer 112 on the substrate 102 is shared by the quantum-well columns as shown by the original informal drawings. No new matter is added.

Claims 1-11 stand finally rejected under 35 USC 102(e) as being anticipated by the structures shown in FIGS. 5 and 6 in Choi' 015. Applicants disagree because FIGS. 5 and 6 in Choi' 015 fail to show recited features in Claims 1-11 as amended.

First, Claim 1 recites "a plurality of quantum-well structures, arranged in columnar shapes." Choi fails to teach this feature of Claim 1. Choi discloses a quantum well detector with a grid of cavities 251 formed to extend through the barrier layers, the well layers, and the upper contact layer. This grid of cavities 251 is used to convert a portion of the input light

into light with polarization substantially perpendicular to the quantum well layers to be absorbed. Notably, the cavities 251 are embedded in the quantum well structure and do not partition the quantum well structure into separate quantum well structures in columnar shapes as recited in Claim 1.

Secondly, the quantum well structures in columnar shapes Claim 1 are "spatially separated from one another by a gap which is electrically insulating." Not so in Choi where FIG. 5 shows that embedded cavities 251 do not spatially separate the quantum well structure into different parts by insulating gaps. Hence, Choi's design in FIGS. 5 and 6 is entirely different from Claim 1.

The Final Office Action contends that, FIG. 6 of Choi shows 4 separated quantum well structures where the lower contact 222 is positioned therebetween. This structure, however, is distinctly different from the column array shown in FIG. 1 of the present application. For example, each area has voids in the quantum layers created by the cavities 251. Also, Choi fails to teach that such a structure as separated by the contact 222 form a periodic array to diffract light absorbed by the quantum wells.

In contrast, Claim 1 as amended recites "said plurality of quantum-well structures formed over said substrate to form a

periodic array to optically diffract light at a wavelength absorbed by said plurality of quantum-well structures." This feature is fully supported by the disclosure on page 5, lines 14-30 of the present specification. This aspect of the amended Claim 1 sets Claim 1 further apart from Choi. In addition, Claim 1 is amended to recite that "each quantum-well layer in each quantum-well structure is continuous without a void" which is supported by the present specification. This recited feature contrasts to the voids in the quantum well layers created by the cavities 251 in FIGS. 5 and 6 of Choi.

In summary, Choi fails to teach each feature recited in Claim 1 as amended. Therefore, under 35 USC 102(b), Claim 1 as amended is distinctly different from and is patentable over Choi.

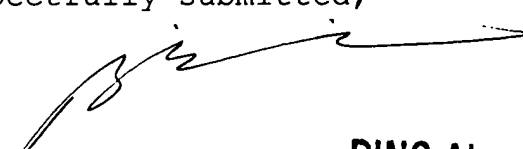
The Final Office Action maintains the double patenting rejection based on the US Patent No. 6,271,537. This rejection, however, has been obviated by a terminal disclaimer filed on March 6, 2002. Hence, this rejection is moot and should be withdrawn.

Applicants respectfully suggest that all outstanding issues are resolved and that all claims are in condition for allowance. An official notice of allowance is hereby respectfully requested. No fee is believed to be due at this time but the

Patent Office is authorized to apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the claims:

Claim 1 has been amended as follows:

1. (Amended) A quantum-well semiconductor device that senses radiation energy, comprising:

a substrate of a substantially transparent semiconductor material; and

a plurality of quantum-well structures, arranged in columnar shapes, and spatially separated from one another by a gap which is electrically insulating, said plurality of quantum-well structures formed over said substrate to form a periodic array to optically diffract light at a wavelength absorbed by said plurality of quantum-well structures,

wherein each quantum-well structure[column] includes, a first conductive contact layer formed over said substrate, a quantum-well stack having a plurality of alternating quantum-well layers formed in parallel over said first conductive contact layer and operating to absorb radiation polarized perpendicularly to said quantum-well layers, and a second conductive contact layer formed over said quantum-well stack, and wherein each quantum-well layer in each quantum-well structure is continuous without a void.